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ABSTRACT

This report discusses techniques for analyzing children's responses to questions about stories as a means of improving reading comprehension. Various sections of the report discuss what knowledge it takes for a child to answer a question; types of questions that can be asked, including explicit, those requiring prior knowledge, and implicit; how to determine a child's instructional needs and reading progress; the advantages of the techniques cited; and ways that teachers can make use of the techniques. (FL)

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PUTTING *The Answer* BEFORE THE QUESTION

A new way of understanding reading comprehension

BY TOM NICHOLSON

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Putting the answer before the question: A new way of understanding reading comprehension.

By Tom Nicholson

Most teachers assess reading comprehension by asking questions. These questions may be very broad, such as 'What was the story about?' or else very detailed, listed on a worksheet perhaps. Yet why do we ask the *kinds* of questions we do? How much story understanding do they really get at? Why is it that some children are able to answer our questions even though we know they are not good readers? In the last five years, we have come a lot closer to understanding the nature of questions (and of children's answers), and as a result, we are now better able to identify what children have to do in order to answer comprehension questions — and how they do it.

Thinking about questions and answers has changed because of the research that has been done on questions. The pacesetters in this respect were not educationists or psychologists but computer scientists who were trying to find out what computers would have to do in order to be able to answer even the simplest of questions. The research in this area is fascinating, and some references are given in the notes for those interested. The difficulties involved in enabling a computer to answer questions only reinforce the great respect I have for the complexity and power of the human mind.

The research done for computer science, as well as the recent research that has now been done in education and psychology, indicate that the form of the question does not tell us very much about what has to be done to answer the question. For example, a 'what' questions suggests that only memory recall is required to obtain the answer. Yet this does not seem to be the case. A recall question could just as easily start with 'why'. An inference question could start with anything — 'what', 'why', 'how', 'when'... The thing that matters is not how a questions starts, but what the reader has to do in order to answer it. Another misleading notion is that 'recall' questions involve answers from the text, whereas 'inferential' questions involve answers that are not stated in the text. Yet the answer in the text may not be the only answer — or even the best answer — and a recall question may trigger off a lot of creative inferences. Questions which involve answers which are not in the text on the other hand, may not involve any inferences, simply because the child was able to answer the question just from prior knowledge — in fact, very little reading may have been done at all.

It may be more productive in future if we get away from this kind of thinking about reading comprehension. It is not all that helpful. It tells us a lot about what the teacher thinks will happen, but very little about what actually does happen. What is now being suggested is an approach which focuses on the question-answering process: trying to think through what a child has to do in order to answer a question. By doing this, the teacher may be better able to make decisions about:

(a) what question to ask
(b) what makes texts difficult
(c) reading progress.

What it takes to answer a question

'John went into the Cobb and Co. restaurant and sat down at the table. He ordered bacon and eggs. He finished his meal and went off to work. He forgot his umbrella.'

(1) Why did John go into the restaurant?
(2) What did he order?
(3) What was the weather like?

The answer to question (1) is not stated in the text, but it is easily answered from our prior knowledge — he probably wanted something to eat. The answer to questions (2) is stated in the text — he ordered bacon and eggs. The answer to question (3), however, depends on both text information ('he forgot his umbrella') and prior knowledge (umbrellas are usually carried when it is wet). The most likely answer is that the weather was wet.

I have tried out these questions on teachers many times. Their answers are usually similar to those given above. But they are not the only possible answers. Teachers have suggested:

for question (1), John may have gone into the restaurant because he works there;

for question (2) the answer that he ordered breakfast, or even dinner, depends on our assumptions about when people usually eat bacon and eggs;

for question (3), the weather may have been sunny: if it had been wet, John would not have forgotten his umbrella!

Answering questions therefore involves not just the words in the story, but a great deal of prior knowledge as well. Writers of stories expect us to use our prior knowledge all the time, in order to make sense of what we read. In fact we do this so easily that we do not even notice it. Writers of mystery stories are very aware of our tendency to do this, and take advantage of it by not telling us the real reason for things that happen. In our story about John, for instance, the umbrella may have actually been a secret weapon which John has used to commit a crime.

Such tricks are usually only played by mystery writers. In general, our prior knowledge is helpful and necessary for understanding texts. It is also helpful for answering questions. In fact, most of the questions we ask depend on what children already know as well as what is in the text

itself. We need to keep this in mind when teaching comprehension and diagnosing it.

Types of questions that can be asked

1. Explicit This type of question has an answer which is explicitly stated in the story. The child can answer this type of question from the text alone, without using prior knowledge. Explicit questions are a useful way of measuring precision of understanding (since the focus is on what is in the text) and can provide clues to the child's decoding ability (simply because the child needs to read in order to find the answer.

When analysing explicit questions, it is important that the answer cannot be worked out just from prior knowledge. The question 'Where did John sit when he went into the restaurant?' is not very useful because the child could get the answer just from prior experience of where one usually sits in a restaurant. A useful checking procedure for the teacher is to ask another adult to answer the question without letting them read the text — this will tell you if the question is, in fact, explicit. We also have to be careful that the question does not introduce a new concept or idea that the child does not understand. For example, the question 'What did John have for breakfast?' makes the assumption that the child will know that bacon and eggs is a common breakfast. In this case, the term 'breakfast' only complicates things and is best omitted. An interesting thing to remember about explicit questions is that children seem to like to answer these ones first. Perhaps it is because they can remember reading the answer in the text and this boosts their confidence.

One teacher I know puts as asterisk beside questions such as these, especially with younger children, to remind them to check the text for the answer. Otherwise, they tend to rely on their memories, and sometimes 'make up' answers.

Explicit questions (which can be called 'locate' questions) get used a lot by teachers. As already mentioned, they are useful. But they also have a problem. The problem is caused by a method of answering questions which is known as 'Search and Destroy'. Some children become very expert at answering explicit questions without ever understanding what a story is about! They get their answers by matching up the words in the question with the words in the story, and then writing in the words that come after. For example, the question 'What did he order?' is answered by searching the text until the child finds the words 'he ordered...' The child then writes down as the answer the words which follow: 'bacon and eggs'. The child gets the correct answer, but it is all done mechanically. One way of stopping this is by preventing the child from looking back at the story. Perhaps we should do this when we suspect 'search and destroy' tactics. Otherwise, I think children should be allowed to look back because it enables them to check to see if what they remembered was correct. It is also a useful research skill. We may not always remember exactly what we read, but we know we can always go back and look it up if necessary.

2. Prior Knowledge This is the type of question that can be answered correctly without even reading the story. Such questions can actually be useful to the teacher because they provide clues to background knowledge. A child who has trouble with a story may simply lack the necessary prior knowledge.

The advantage of prior knowledge questions is that they help the teacher to establish what children know before they start reading. In this way, potential difficulties can be anticipated and dealt with. These kinds of questions should probably not be asked first, simply because children often don't know the answers, and this can be embarrassing. The questions are probably best asked of a group, so that children can share their prior knowledge and embarrassment is avoided.

3. Implicit This type of question demands both prior knowledge and text information in order to obtain a sensible answer. To answer the question, the child has to read and understand the story — there is no way of guessing the answer from the question alone. 'What does the fact that John had an umbrella with him tell you about the weather that day?' is a poor question for this purpose — there are too many clues in it. Further, the answer to an implicit question must not be explicitly stated in the story, although it can be inferred from relevant clues in the story. 'What was the weather like that day' is a good implicit question. The answer cannot be guessed just from the question, and it is not stated in the story. The child has to put prior knowledge and text knowledge together.

Implicit questions can be very frustrating for children, especially when they cannot find an answer stated in the story. Yet if handled in the right way, they can be exciting questions to ask. Implicit questions (by definition) have no one answer. Once children realise this, they can begin to enjoy thinking of all the possible answers they could give. In a class discussion about the question 'What was the weather like that day?', lots of possible answers may be given:

It was really a very hot day. The umbrella was a sunshade.

If John was an umbrella salesman, then we can't say what the weather was like.

John was a pessimist. He always expected rain, even on hot days.

Questions, stories and children's answers

The story in Figure 1 is given as an example of what children are often given, particularly as resource material in social studies, and particularly in the secondary school. The questions in Figure 2 are of the three types discussed above: Explicit, Prior Knowledge and Implicit.

FIGURE 1

An extract from 'Children of the Poor' by John A. Lee (taken from a Social Studies Unit)

There wasn't much work about, and mother grew glummer as day succeeded day... It was a time when shopkeepers did not rely on newspaper advertising as much as they do today. They merely hung out a notice "Boy Wanted" and the news spread. I perambulated the streets looking for such a notice. Message boys were in demand before mechanical transport came along. One day I found the card outside a boot shop.

SMART BOY WANTED

That was me.

"Ever been at work before?"

"No, Sir."

"We want a message boy."

"I can run messages."

"The wages are seven and sixpence a week."

"Yes, Sir."

"When will you begin?"

"Today."

"Wait till I sack the other boy!"

God knows what criminality the other boy had become involved in, but the announcement was a shock. The man called the other boy out and told him.

"You're sacked. I'll pay you in a few minutes."

"I don't care," the boy replied.

"Sacked for giving cheek."

"I was going to leave, anyhow".

Why had I none of that boy's assurance?

"You see what giving cheek does?" the boss asked.

"I don't give cheek, mister."

"See that you don't."

I was sent out at once on an errand. The man informed me that I could go home for the day when my parcel was delivered, but ordered me to be at work at eight in the morning, I almost ran with that parcel, my heart singing a song of joy. When the errand was completed I ran home, excited and elated. In the home there was great joy. My first job. Wonderful, glowing prophecy greeted me. I was a hero in my own right.

"Learn the business and buy a shop," was my brother's advice.

"I think I shall," was my modest answer.

FIGURE 2

Questions for 'Children of the Poor'

Prior Knowledge

1. What do you do when you perambulate?
   ER (Expected Response) = you wander around.

How do you feel when you are 'elated'?
   ER = very happy, excited.

How do you feel when you are glum?
   ER = sad.

2. Why was there not much work about?
   ER = There was a depression. Lots of people were unemployed.

Explicit

3. What kind of shop was it?
   ER = Boot shop.
4. How did the shopkeeper advertise the job?
   ER = He put a notice in the shop window.
5. Why did the other message boy get the sack?
   ER = He gave cheek to the shopowner.
6. Why did his brother want him to learn the business?
   ER = So he could eventually own a shop of his own.

Implicit

7. When do you think this story happened?
   ER = In the depression years — but before mechanical transport — maybe the 1890's.
8. What was so impressive about the other boy when he found out he was sacked?
   ER = His assurance, he did not get flustered even though the sacking came as a shock.
9. Why did he need the job?
   ER = The family was poor — they needed the money.
10. Why was he a hero in the house?
    ER = He had got a job — he would bring in extra money.

When this story was tried out on some high school students who were studying 'social mobility' an interesting result was the difficulty some of the students had in establishing exactly *when* the story took place. This caused problems with question 7, where students argued that the story took place about 20 years ago or else just a few years ago. In the story it was mentioned that the events took place 'before there was mechanical transport'. This concept seemed to be understood — one student mentioned that it meant 'when there was no cars and things'. The problem was that she had no idea when this would have be. She had never heard of the author, John A. Lee, and she couldn't think of a time (such as the depression) when lots of people were unemployed. She did not have the prior knowledge to link up with the text knowledge.

Another student regarded the story as 'modern day' (she

was probably using her prior knowledge of the current economic situation, and the problems facing school leavers). On the other hand, we knew she was having some difficulties in reading generally and this showed up in some of her other responses. She had difficulty with the concepts of 'perambulate' and 'elated' in question 1, indicating that word difficulty may have been too high in the story. In question 9, 'Why did he need the job?', she argued that 'he got a bit sick of hanging around and mucking about the streets and around home'. In question 10, 'Why was he a hero in the house?', she answered that it was 'because this mother was getting sick of him just wandering around the house doing nothing.' What had happened was that she had used her prior knowledge to fill in the gaps that she hadn't understood while reading. She had the 'gist' of the story, but she had also lost some important details.

Deciding on instructional needs and reading progress

In all, the students responses were useful from the teachers' point of view. They revealed that the children were unsure of some word meanings, that they were unsure of why there was not much work about, and that they had little idea of when motor transport arrived in New Zealand. This kind of information can help to guide the teacher's instructional plans. Discussion of the shades of meaning in words like 'perambulate,' 'walk' and 'saunter' could lead on to a similar discussion of shades of meaning among words used as synonyms for 'social mobility' — such as 'social climber', 'getting-on', etc. Some discussion of what life was like before the motor car and during the depression of the 1890s could enrich student understanding of the notion of 'social mobility'. Children could find out what 7s 6d would buy in those days — then they might understand why the boy in the story wanted to get his own shop one day! Children could try to find out how mechanical transport would have made his job redundant — giving him even more reason to 'get on' in life! Students' answers to questions, then, can help the teacher to plan appropriate instruction which will help them better to grasp the meaning of the text.

Why change to this way of looking at comprehension?

This approach has several advantages over others. Firstly, it is *explanatory*. It enables the teacher to look at any questions and work out what the child needs to do in order to answer it. It also explains why children often give completely different responses to the ones we expected. It also shows how children can get some questions correct, yet still not understand very much about the story.

Secondly, it has *diagnostic* uses. Children who always get their answers from the story, even when the answers do not make sense, may lack appropriate prior knowledge of the topic. Children whose answers seem to be based too much on prior knowledge may be having some trouble in decoding and/or understanding word meanings in the text. The teacher can thus interpret children's answers in ways which enable follow-up.

The third advantage is that the approach is *easy to operate*. The teacher (and even the students) can devise and interpret questions which focus on prior knowledge (which the reader brings to the text), explicit knowledge (which is in the text) and implicit knowledge (which is implied by the text).

The fourth advantage is that *it does not tie you down to any form of question*. Teachers do not have to ask *why*-type questions, especially if they think that they may make children over-anxious or frightened. The same question, for example, 'Why was he a hero in the house?' could be written in a number of different ways, but still get at the same kind of answer:

What made him a hero in the house?
How did he become a hero in the house?
Tell me about how he became a hero in the house.
Can you think of what made him a hero in the house?

The fifth advantage is that it *emphasises the importance of the story* in question-answering. Social studies resource units may have lots of other advantages, but they are certainly very demanding in the amount of prior knowledge required of children in order to understand the many 'extracts' which they have to read. Children in secondary school may have the ability to link up ideas (as in implicit questions), but if they do not have any ideas to link (because they lack prior knowledge) then they can't make use of their ability.

The sixth advantage of this approach is that it is *flexible*. The teacher can apply the ideas to any material which the children are reading, and to any questions which the children have to answer.

Making use of this way of understanding comprehension

Teachers can use this approach for making up questions about stories, but the main advantage will be in interpreting children's answers to the many different kinds of questions we ask them to complete. The checklist shown in Figure 3 is a simple breakdown of the kinds of possible answers that children can give to the different kinds of questions we ask them to complete.

The first category shown in the checklist indicates that the answer has the same meaning as in the text (this category applies only to explicit questions, by definition). The remaining categories divide answers into those which are sensible (that is, make sense in the context of the story), irrelevant or non-responses. The categories are very broad, but teachers can use them as a basis for a more complex system if necessary. I can see, for instances, how the 'relevant' category could be expanded into two parts: one for answers which make very little use of text clues, and one for answers which use a lot of text clues.

FIGURE 3
Teacher's checklist for analysing children's answers

Code	
▨	= not applicable
✓✓	= very acceptable
✓	= acceptable
?	= child seems to be ignoring or misunderstanding the text clues
✗	= not acceptable

TYPES OF ANSWERS	TYPES OF QUESTIONS		
	Explicit	Implicit	Prior knowledge
The answer is the same or similar to that in the text	✓✓	▨	▨
The answer is sensible and makes use of text clues	✓	✓✓	▨
The answer is sensible but relies almost entirely on prior knowledge	?	?	✓✓
The answer is not sensible	✗	✗	✗
No answer is given	✗	✗	✗

Conclusion

When we ask children to answer questions about stories, we are asking them to perform tasks. From the teacher's point of view, what is needed is a way of analyzing those tasks so that the answers tell the teacher how to help children to improve their understanding of stories. The techniques which have been discussed enable the teacher to focus on those factors which are essential to story understanding. They provide a way of thinking about reading comprehension which is useful, helpful and in line with current research on the nature of understanding.

Notes

Computers and questioning
For those who would like to follow-up some of the exciting (but somewhat technical) ideas which came from computer scientists, the following references will be useful, partly because they provide a quick, practical introduction to the issues involved, and partly because they have good bibliographies:

Pearson, P. D. and Nicholson, T. *Scripts, Texts and Questions.* Paper presented at the National Reading Conference, Atlanta, December 1976.

Nicholson, T. *Scripts, Stories and the Young Reader.* Paper presented at the ANZAAS Conference, Melbourne, August 1977.

Pearson, P. D. and Johnson, D. *Teaching Reading Comprehension.* New York: Holt, Rinehart and Winston, 1978.

Reading research in education and psychology
There has been an explosion of research interest in reading comprehension — and all in the last few years. With psychologists in the area as well, the number of studies being conducted is too great to summarise, the references listed above also include some of the more important studies in cognitive psychology and education. Another useful reference is:

Pearson, P. D. *Perspectives on Reading Comprehension.* A paper presented at the International Reading Association Conference, Houston, May 1978.

'Made-up' answers by children
This tendency of children to 'make up' answers rather than look back at the text was noted in a study by T. Nicholson and R. Imlach. *The influence of text and prior knowledge on childrens understanding of short stories.* Unpublished paper. University of Waikato, 1978. This result needs further investigation, but it does reflect the kinds of things children often say about their own 'look-back' behaviour, such as 'I only look back when I can't remember the answer', or, 'I look back sometimes — some questions are hard'.

Locate questions
Locate questions are discussed in R. Wilson *Diagnostic and Remedial Reading for Classroom and Clinic,* New York, Merrill, 1977.

'Search and Destroy' answering
The notion of 'search and destroy' in question-answering is discussed in P. D. Pearson. Some practical applications of a psycholinguistic model of reading. In S. J. Samuels (ed) *What Research Has to Say About Reading Instruction,* Newark, IRA, 1978.

The 'social mobility' questions
The children's answers which are discussed in this article were gathered at Melville High in Hamilton, as part of an intensive workshop initiated jointly by the reading resource teacher and the social studies department in that school.